(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 0 407 192 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
05.03.1997 Bulletin 1997/10

(51) Int. Cl.^{6}: **C07D 215/233**, C07D 215/56, C07D 219/06, C07D 409/12, C07D 405/12, A01N 43/42

(21) Application number: **90307357.5**

(22) Date of filing: **05.07.1990**

(54) 4-Acyloxyquinoline derivatives and insecticidal or acaricidal compositions containing same

4-Acyloxychinolin-Derivate und diese enthaltende insektizide und akarizide Mittel

Dérivés acyloxy-4-quinoléine et compositions insecticides et acaricides les contenant

(84) Designated Contracting States:
CH DE FR GB IT LI

(30) Priority: **07.07.1989 JP 176187/89**

(43) Date of publication of application:
09.01.1991 Bulletin 1991/02

(60) Divisional application: **95200798.7**

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- **LIEBIGS ANNALEN DER CHEMIE, 1982, pages 1656-1676; H. GILDEMEISTER et al.: "Neue 4-Chinolinol- und 5,6,7,8-Tetrahydro-4-chinolinol-abkömmlinge mit biozider Wirkung"**
- **JOURNAL OF ORGANIC CHEMISTRY, vol. 54, no. 1, 6th January 1989, pages 166-171; O.J. MUSICO et al.: "Hydrolyses of 2- and 4-fluoro N-heterocycles. 3. Nucleophilic catalysis by buffer bases in the general acid catalyzed hydrolysis of 4-fluoroquinaldine"**
- **TETRAHEDRON LETTERS, vol. 22, no. 47, 1981, pages 4733-4736; M. SAWADA et al.: "Total reactivity of pyridine and quinoline via the reactions of arylbenzoates with hydroxide ion. Apparent substituent constants for some N-heteroaromatic groups"**
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- **Chem. Abstr. 66 (1967): 55404c**
- **J. Het. Chem. 15, (1978) 551**
- **Reg. Handbook number section reg. n 111947-01-4 and 111947-02-5 & Chem. Abstr. 108 (1988): n 21749q**
- **Reg. Handbook number section reg. n 110506-05-3& Chem. Abs. 107 (1987): n 134812c**

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- **Reg. Handbook number section reg. n 74557-75-8 & Chem. Abstr. 93 (1980): n 95178w**
- **Indian J. Pharm. Sci. 49 (1987) 17-21**

Remarks:

The file contains technical information submitted after the application was filed and not included in this specification

Description

BACKGROUND

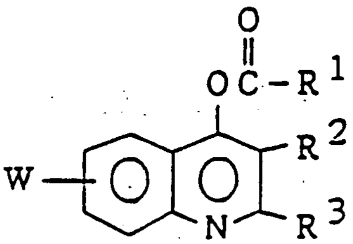
The present invention relates to a 4-acyloxyquinoline derivative useful as an insecticide containing it as an effective ingredient, and to a process for its preparation.

A variety of compounds having insecticidal or acaricidal activities have hitherto been developed. However, it is desired to develop a new insecticide having an excellent activity because of the problem such as the recent increase of insecticidal resistance.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide novel compounds which have an excellent insecticidal acaricidal and activity.

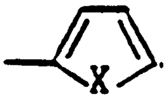
Thus, the invention, in one aspect thereof, provides a novel compound having the formula (I):



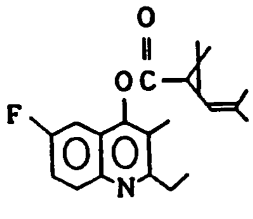
(I)

wherein

R^1 represents hydrogen; C_{1-18} alkyl; C_{2-18} alkenyl; C_{3-10} cycloalkyl which may be optionally substituted with halogen or C_{1-4} alkyl; phenyl-C_{1-4} alkyl; phenyloxy-C_{1-4} alkyl; phenyl; C_{1-4} alkyl and/or halogen-substituted phenyl; naphthyl; C_{1-4} alkyl and/or halogen-substituted naphthyl; a group OR^4 where R^4 represents C_{1-4} alkyl, phenyl, C_{1-4} alkyl and/or halogen-substituted phenyl, naphthyl, or C_{1-4} alkyl and/or halogen-substituted naphthyl; or a group:



where X represents an oxygen or a sulphur atom;
R^2 represents C_{1-4} alkyl; or a group -COOR^5 where R^5 represents hydrogen or C_{1-4} alkyl;
R^3 represents hydrogen or C_{1-10} alkyl;
provided that R^2 does not represent COOR^5 when R^3 represents hydrogen; and
R^2 and R^3 may together represent -$(CH_2)_m$-, where m is 3 or 4;
W represents hydrogen, one to four halogen atoms, C_{1-4} alkyl or C_{1-4} alkoxy which may be same or different and with which the left-hand benzene ring is substituted; or a derivative represented by the formula:



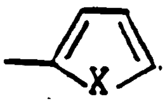
DETAILED DESCRIPTION OF THE INVENTION

Compound

The compound according to the present invention is a 4-acyloxyquinoline derivative represented by the above-mentioned general formula (I).

R^1, R^2, R^3 and W have the following meanings.

In the compounds of formula (I), R^1 represents a hydrogen atom, a C_1-C_{18} alkyl, C_2-C_{18} alkenyl, C_3-C_{10} cycloalkyl which may be optionally substituted, phenyl C_{1-4} alkyl, phenoxy C_{1-4} alkyl, phenyl, C_{1-4} alkyl and/or halogen-substituted phenyl, naphthyl, C_{1-4} alkyl and/or halogen-substituted naphthyl, a group OR^4, where R^4 represents a C_{1-4} alkyl, phenyl, C_{1-4} alkyl and/or halogen-substituted phenyl, naphthyl or C_{1-4} alkyl and/or halogen-substituted naphthyl, or a group:



wherein X represents an oxygen or a sulphur atom.

A C_1-C_{18} alkyl and C_2-C_{18} alkenyl group may be a straight or branched chain. A C_3-C_{10} cycloalkyl may be substituted by a halogen atom or a C_{1-4} alkyl group.

The C_{1-4} alkyl group includes straight and branched chain alkyl groups of from one to four, preferably one to three, carbon atoms.

In the compounds of formula (I), R^2 represents a C_{1-4} alkyl group or a group $-COOR^5$, wherein R^5 represents a C_{1-4} alkyl group, provided that R^2 does not represent $COOR^5$ when R^3 represents hydrogen.

In the compounds of formula (I), R^3 represents a hydrogen atom or a C_1-C_{10} alkyl group. The C_1-C_{10} alkyl group may be a straight or branched chain.

R^2 and R^3 together represent a group $(CH_2)_m$, wherein m is 3 or 4.

In the compounds of formula (I), W represents a hydrogen atom or 1 to 4 halogen atoms, such as fluorine, chlorine, bromine and iodine, or a C_{1-4} alkyl or C_{1-4} alkoxy group, which may be the same or different and with which the left-hand nucleus is substituted. That is, W represents not only one of group such as halogen atoms and a C_{1-4} alkyl and C_{1-4} alkoxy group, but also two to four of them which are attached to the benzene ring moiety of the molecule.

Specific examples of the compounds of the present invention represented by the formula (I) include the following compounds:

4-acetoxy-2,3-dimethyl-6-fluoroquinoline,
4-acetoxy-2-ethyl-6-fluoro-3-methylquinoline,
4-cyclopropanecarbonyloxy-2-ethyl-6-fluoro-3-methylquinoline,
4-ethoxycarbonyloxy-2-ethyl-6-fluoro-3-methylquinoline,

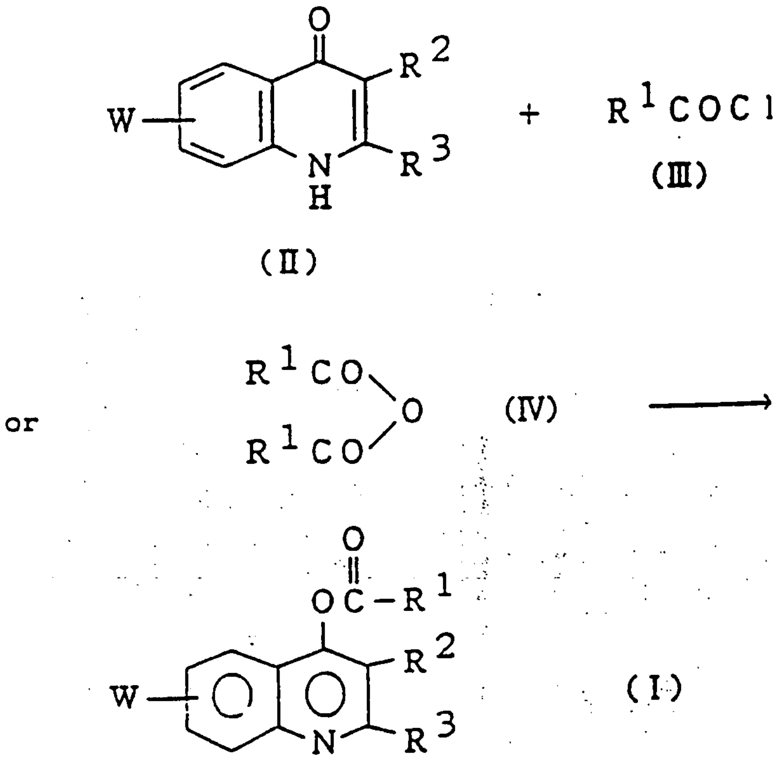
and

Synthesis of the Compound

The compounds represented by the formula (I) can be synthesized by any appropriate methods with reference to the formation of bonds or the introduction of substituents.

For example, the compound represented by the formula (I) can be synthesized in accordance with well-known methods, for example, those described in (i) J. Chem. Soc. (C) ,1970, 2426; (ii) Tetrahedron Lett., 1968, 4945; or (iii) Tetrahedron Lett., 1971, 4223, and outlined hereinafter. In the following description, the group R^1, R^2, R^3 and W are as previously defined for compounds of general formula (I).

A compound of general formula (I) may be prepared by reacting the compound of formula (II), with a compound of formula (III) or (IV) in the presence or absence of a base:



Examples of the base are organic amines such as triethylamine and pyridine, and inorganic alkalis such as sodium carbonate, potassium carbonate and sodium hydride. The compound of formula (II) can be synthesized in accordance with well-known methods, for example those described in (i) J. Am. Chem. Soc., 70, 2402, (1948); (ii) Tetrahedron Lett., 27, 5323 (1986).

Use of Compound/Insecticidal and Acaricidal Composition

The compounds of formula (I) are effective for killing harmful insects, for example, Hemiptera such as aphids, plaxthoppers, leafhoppers, and bugs; Lepidoptera such as Tobacco Cutworm, and Diamondback Moth; Thripidae such as Thrips palmi; Coleoptera such as beatles and weevils; Diptera such as Housefly and mosquitoes; Blattaria such as cockroachs; Acarina such as Tetranychus cinnabarinus and Dermatophgoides farinae; Orthoptera.

The compound of formula (I), when used as an effective ingredient of an insecticide or acaricide, may be used directly as the raw material or generally is mixed with auxiliaries for preparations such as a solid carrier, a liquid carrier, a gas carrier, a surfactant or a dispersant or feed into any preparation forms such as an emulsion, a liquid agent, a hydration agent, a powder, a pellet, an oil agent, an aerosol, a flowable agent or a toxic feed.

As the solid carrier, there are mentioned, for example, talc, bentonite, clay, kaolin, diatomaceous earth, vermiculite, white carbon and calcium carbonate. The liquid carrier includes alcohols such as methanol, n-hexanol, ethylene glycol and cellosolve; ketones such as acetone, methyl ethyl ketone and cyclohexanone; aliphatic hydrocarbons such as kerosine and a lamp oil; aromatic hydrocarbons such as benzene, toluene, xylene and methylnaphthalene; halogenated hydrocarbons such as dichloroethane, trichloroethylene and carbon tetrachloride; ethers such as diethyl ether, dioxane and tetrahydrofuran; esters such as ethyl acetate; nitriles such as acetonitrile and isobutyronitrile; acid amides such as dimethylformamide and dimethylacetamide; plant oils such as soy bean oil and cotton seed oil; dimethylsulfoxide and water. As the gaseous carrier, there are mentioned, for example, LPG, flon gas, air, nitrogen, carbon dioxide gas and dimethyl ether.

As the surfactant or the dispersant for emulsification, dispersion, spreading or the like, there are used, for example, alkylsulfate esters, alkyl (or aryl) sulfonate salts, polyoxyalkylene alkyl (or aryl) ethers, polyalcohol esters, lignin sulfonate salts or the like.

Moreover, as the auxiliary for improving the properties of the preparation, there are used, for example, carboxymethylcellulose, gum arabic, polyethylene glycol, calcium stearate or the like.

The aforementioned carriers, surfactants, dispersants and auxiliaries are used alone or in combination thereof, if required.

The amount of active ingredients in the preparation is usually in the range of 1 to 75 parts by weight for the emulsion, 0.3-25 parts by weight for the powder, 1-90 parts by weight for the hydration agent, and 0.5-10 parts by weight for the particles.

These preparations are used directly or upon dilution. They can be also used in admixture with other insecticides, acaricides, bacteriocides, herbicides, plant growth controlling agents, fertilizers, soil conditioners, synergists or the like.

Insecticides may include the following compounds as the active ingredients:

4-acetoxy-2,3-dimethyl-6-fluoroquinoline,
4-acetoxy-2-ethyl-6-fluoro-3-methylquinoline,
4-cyclopropanecarbonyloxy-2-ethyl-6-fluoro-3-methylquinoline,
4-ethoxycarbonyloxy-2-ethyl-6-fluoro-3-methylquinoline,

and

Experimental examples

The present invention is further explained in detail with reference to the experimental examples.

Example 1:

4-acetoxy-2,3-dimethylquinoline (compound No.1)

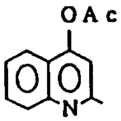
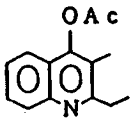
A solution of 1.73 g of 2,3-dimethyl-4-quinolone in 25 ml of acetic anhydride was stirred at 130°C for 8 hours. The solution was evaporated to remove the solvent under reduced pressure, and 30 ml of chloroform was added to the solution. The mixture was washed with an aqueous saturated sodium hydrogen carbonate solution and water and dried over sodium sulfate. The solvent was evaporated under reduced pressure, and the crude product thus obtained was purified by silica gel column chromatography (Wako Gel C-200) to give 1.87 g of 4-acetoxy-2,3-dimethylquinoline.
m.p. : 93-94°C
NMR ($CDCl_3$)δ : 2.24 (s,3H), 2.47 (s,3H), 2.69 (s,3H), 7.3-8.1 (m,4H).
EI-ms : 215 (M^+), 173.

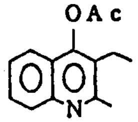
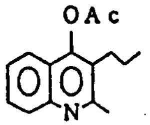
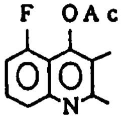
Example 2:

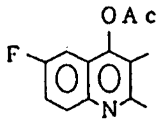
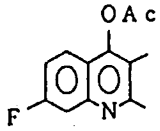
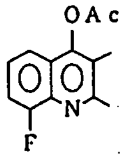
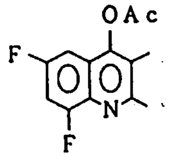
4-cyclopropanecarbonyloxy-2-ethyl-6-fluoro-3-methylquinoline (compound No.2)

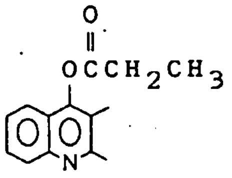
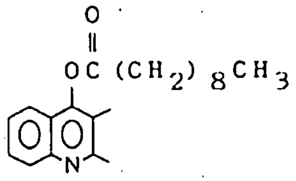
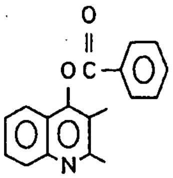
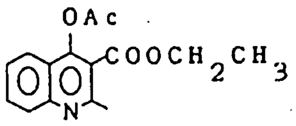
To a solution of 180 mg of sodium hydride in 10 ml of dimethylformamide was added 923 mg of 2-methyl-6-fluoro-3-methyl-4-quinolone on an ice bath, and the solution was stirred at room temperature for 15 min. After the solution was cooled on an ice bath, and 470 mg of cyclopropanecarbonyl chloride was added to the solution, and the mixture was stirred at room temperature for 4 hours. The mixture was poured into 20 ml of water. The solution was extracted with chloroform, and the chloroform solution was washed with water, dried over sodium sulfate. The solvent was evaporated under reduced pressure, and the crude product thus obtained was purified by silica gel column chromatography (Wako Gel C-200, n-hexane: ethyl acetate= 7 : 1) to give 1.02 g of 4-cyclopropanecarbonyloxy-2-ethyl-6-fluoro-3-methylquinoline.
m.p. : 86-87°C ,
NMR ($CDCl_3$)δ : 1.0 ~ 1.5 (m,6H), 1.6 ~ 2.2 (m, 2H), 2.28 (s,3H), 3.00 (q, 2H, J=7.5Hz), 7.1 ~ 7.5 (m,2H), 8.03 (dd, 1H, J=9Hz, 5Hz). ir (KBr) 2900, 2760, 1600, 1560, 1200cm^{-1}.
EI-MS : 273 (M^+), 205.

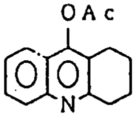
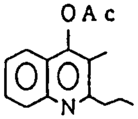
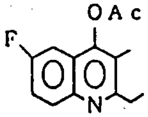
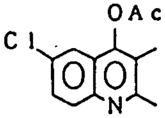
Compound No.3-compound No.65 were synthesized below in similar manners as the above described preparation examples.

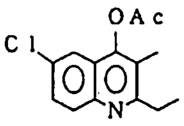
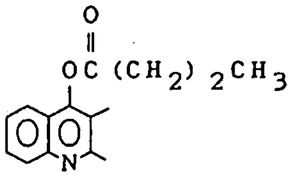
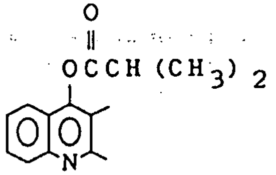
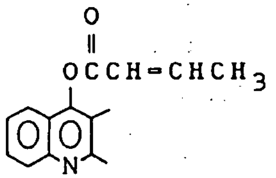
Compound No.	Compound	Spectral data	m. p.
3	 (Ac : -COCH3)	NMR ($CDCl_3$) δ : 2. 44 (s, 3H)、2. 72 (s, 3H)、7. 12 (s, 1H)、7. 3~8. 1 (m, 4H)。 ir (neat) 1760、1620、1600、1190cm^{-1}	oil
4		NMR ($CDCl_3$) δ : 1. 36 (t, 3H, J=8Hz)、2. 25 (s, 3H)、2. 44 (s, 3H)、2. 99 (q, 2H, J=8Hz)、7. 3~8. 1 (m, 4H)。 ir (KBr) 2950、1760、1620、1600、1550、1200cm^{-1} EI-ms 229 (M^+)、187、186、	66~67℃

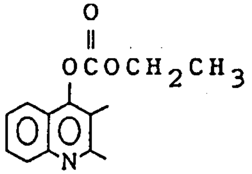
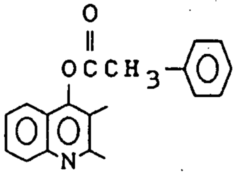
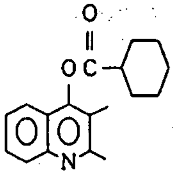
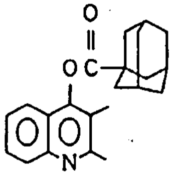
Compound No.	Compound	Spectral data	m. p.
7		NMR ($CDCl_3$) δ: 1. 19 (t, 3H, J=7. 5Hz)、 2. 46 (s, 3H)、2. 74 (s, 3H)、 2. 70 (q, 2H, J=7. 5Hz)、7. 3~8. 1 (m, 4H)。 El-ms 229 (M^+)	40~41℃
8		NMR ($CDCl_3$) δ: 1. 01 (t, 3H, J=8Hz)、 1. 40~1. 80 (m, 2H)、2. 47 (s, 3H)、 2. 74 (s, 3H)、2. 50~2. 70 (m, 2H)、 7. 30~7. 70 (m, 3H)、7. 90~8. 10 (m, 1H)。 ir (neat) 2950、1760、1620、1600、1190cm^{-1} El-ms 243 (M^+)、201	oil
9		NMR ($CDCl_3$) δ: 2. 22 (s, 3H)、2. 39 (s, 3H)、 2. 65 (s, 3H)、7. 10 (ddd, 1H, J=12Hz, J=8Hz, J=1Hz)、7. 52 (dt, 1H, J=6Hz, J=8Hz)、7. 88 (d, 1H, J=8Hz)。 ir (KBr) 3000、1760、1620、1600、1560、1200cm^{-1} El-ms 233 (M^+)、191	111~112℃

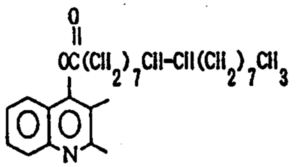
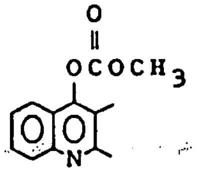
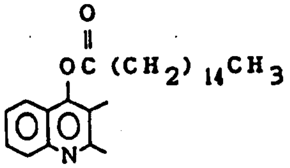
Compound No.	Compound	Spectral data	m. p.
10		NMR ($CDCl_3$) δ : 2. 22 (s, 3H)、2. 47 (s, 3H)、 2. 67 (s, 3H)、7. 13~7. 48 (m, 2H)、 7. 93 (dd, 1H, J=9Hz, J=5Hz)。 EI-ms 233 (M^+)、191 ir (KBr) 3000、1750、1600、1560、1200cm^{-1}。	107~108℃
11		NMR ($CDCl_3$) δ : 2. 20 (s, 3H)、2. 46 (s, 3H)、 2. 67 (s, 3H)、 7. 26 (dt, 1H, J=9Hz, J=2. 6Hz)、 7. 64 (dd, 1H, J=10Hz, J=2. 6Hz)、 7. 69 (dd, 1H, J=9Hz, J=6Hz)。 ir (KBr) 2920、1760、1620、1560、1500、1200cm^{-1} EI-ms 233 (M^+)、191	105~106℃
12		NMR ($CDCl_3$) δ : 2. 24 (s, 3H)、2. 47 (s, 3H)、 2. 74 (s, 3H)、7. 1~7. 5 (m, 3H)。 ir (KBr) 2900、1760、1600、1200cm^{-1} EI-ms 233 (M^+)、191	122~123℃
13		NMR ($CDCl_3$) δ : 2. 23 (s, 3H)、2. 46 (s, 3H)、 2. 71 (s, 3H)、6. 97~7. 27 (m, 2H)。 EI-ms 251 (M^+)、209、180	116~117℃

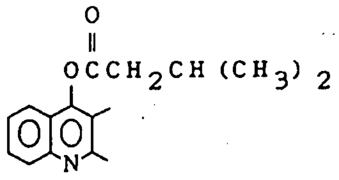
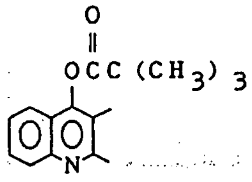
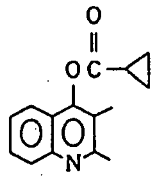
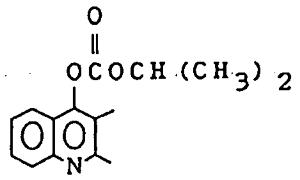
Compound No.	Compound	Spectral data	m. p.
14		NMR (CDCl₃) δ: 1. 36 (t, 3H, J=7. 5Hz)、 2. 21 (s, 3H)、2. 69 (s, 3H)、 2. 78 (q, 2H, J=7. 5Hz)、7. 3~8. 1 (m, 4H)。 ir (KBr) 2900、1750、1620、1600、1140cm⁻¹。 EI-ms 229 (M⁺)、173	76~77℃
15		NMR (CDCl₃) δ: 0. 77~1. 03 (m, 3H)、 1. 10~1. 60 (m, 14H)、1. 70~2. 10 (m, 2H)、 2. 21 (s, 3H)、2. 68 (s, 3H)、 2. 74 (t, 2H, J=7. 5Hz)、7. 3~8. 1 (m, 4H)。 EI-ms 327 (M⁺)、174、173 ir (KBr) 2900、2850、1750、1620、1600、 1140cm⁻¹。	52~53℃
16		NMR (CDCl₃) δ: 2. 28 (s, 3H)、2. 72 (s, 3H)、 7. 2~8. 4 (m, 9H)。 EI-ms 277 (M⁺) ir (KBr) 3000、1720、1620、1600、1240cm⁻¹。	163~164℃
17		NMR (CDCl₃) δ: 1. 40 (t, 3H, J=7Hz)、 2. 42 (s, 3H)、2. 81 (s, 3H)、 4. 40 (q, 2H, J=7Hz)、7. 3~8. 1 (m, 4H)。 EI-ms 273 (M⁺)、231、186	92~93℃

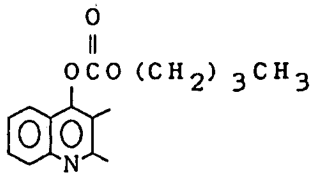
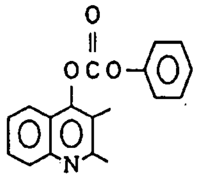
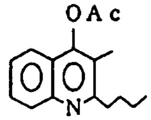
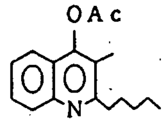
Compound No.	Compound	Spectral data	m. p.
18		NMR (CDCl$_3$) δ: 1. 60～2. 10 (m, 4H)、 2. 42 (s, 3H)、2. 60～2. 83 (m, 2H)、 2. 97～3. 20 (m, 2H)、7. 2～8. 1 (m, 4H)。 EI-ms 241 (M$^+$)、199、198	102～103℃
19		NMR (CDCl$_3$) δ: 1. 05 (t, 3H, J=8Hz)、 1. 60～2. 10 (m, 2H)、2. 26 (s, 3H)、 2. 46 (s, 3H)、2. 95 (t, 2H, J=8Hz)、 7. 30～7. 75 (m, 3H)、7. 90～8. 10 (m, 1H). EI-ms 243 (M$^+$)、200、173	98～99℃
20		NMR (CDCl$_3$) δ: 1. 34 (t, 3H, J=8Hz)、 2. 23 (s, 3H) 2. 44 (s, 3H)、 2. 96 (q, 2H, J=8Hz)、7. 10～7. 50 (m, 2H)、 8. 04 (dd, 1H, J=9Hz, J=5Hz). ir (KBr) 2970、1760、1610、1210cm^{-1} EI-ms 247 (M$^+$)、205、204	111～112℃
21		NMR (CDCl$_3$) δ: 2. 19 (s, 3H)、2. 45 (s, 3H)、 2. 65 (s, 3H)、7. 40～7. 65 (m, 2H)、 7. 89 (d, 1H, J=8. 8Hz). ir (KBr) 1760、1600、1480、1200cm^{-1} EI-ms 249 (M$^+$)、207	112～113℃

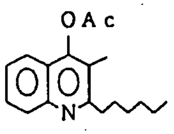
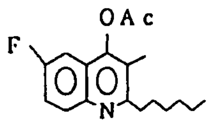
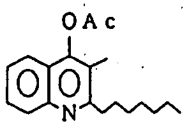
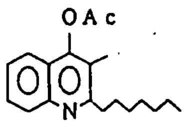
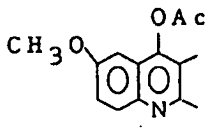
Compound No.	Compound	Spectral data	m. p.
22		NMR ($CDCl_3$) δ : 1. 35 (t, 3H, J=7. 5Hz)、 2. 25 (s, 3H)、2. 48 (s, 3H)、 2. 98 (q, 2H, J=7. 5Hz)、7. 40~7. 70 (m, 2H)、 7. 95 (d, 1H, J=8. 8Hz). ir (KBr) 2960、1760、1600、1480、1200cm^{-1} EI-ms 263 (M^+)、221	106~107℃
23		NMR ($CDCl_3$) δ : 1. 13 (t, 3H, J=8Hz)、 1. 92 (m, 2H)、2. 25 (s, 3H)、2. 72 (s, 3H)、 2. 77 (t, 2H)、7. 4~8. 1 (m, 4H)、 EI-ms 243 (M^+)、173、144	78~80℃
24		δ : 1. 50 (d, 6H, J=7Hz)、2. 52 (s, 3H)、 3. 10 (s, 3H)、3. 11 (m, 1H)、7. 7~8. 8 (m, 4H)、 EI-ms 243 (M^+)、173、144	130℃
25		δ : 2. 06 (dd, 3H, J=6. 9, 1. 8Hz)、 2. 26 (s, 3H)、2. 73 (s, 3H)、6. 23 (m, 1H)、 7. 36 (m, 1H)、7. 4~8. 1 (m, 4H) EI-ms 241 (M^+)、173、144	133~135℃

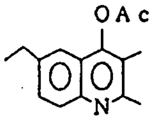
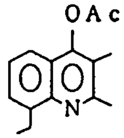
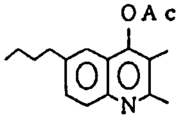
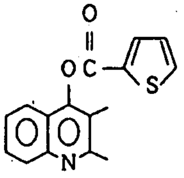
Compound No.	Compound	Spectral data	m. p.
26		δ : 1. 44 (t, 3H, J=7. 2Hz)、2. 32 (s, 3H)、 2. 73 (s, 3H)、4. 39 (q, 2H, J=7. 2Hz)、 7. 4~8. 1 (m, 4H)、 EI-ms 245 (M⁺)、201、173、144	79~81℃
27		δ : 2. 12 (s, 3H)、2. 69 (s, 3H)、 4. 05 (s, 2H)、7. 3~8. 0 (m, 9H)、 EI-ms 291 (M⁺)、174、144	104~106℃
28		δ : 1. 29~1. 49 (m, 3H)、1. 68~1. 94 (m, 5H)、 2. 23 (s, 3H)、2. 23~2. 25 (m, 2H)、 2. 72 (s, 3H)、2. 75~2. 83 (m, 1H)、 7. 44~8. 02 (m, 4H)、 EI-ms 283 (M⁺)、173、144	87~88℃
29		δ : 1. 71~2. 30 (m, 15H)、2. 22 (s, 3H)、 2. 72 (s, 3H)、7. 44~8. 02 (m, 4H)、 EI-ms 335 (M⁺)、173、144	174~178℃

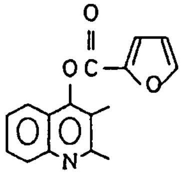
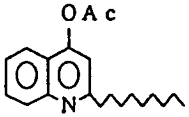
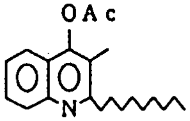
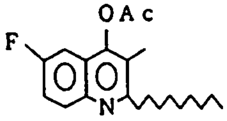
Compound No.	Compound	Spectral data	m. p.
30		δ:0.88 (t, 3H, J=6.8Hz)、 1.18~1.54 (m, 20H)、1.87 (quintet, 2H, J=7.6Hz)、1.92~2.10 (m, 4H)、 2.24 (s, 3H)、2.72 (s, 3H)、 5.31~5.42 (m, 2H)、7.45~8.02 (m, 4H) EI-ms 437 (M⁺)、265、173、144	oil
31		δ:2.32 (s, 3H)、2.74 (s, 3H)、 3.99 (s, 3H)、7.5~8.0 (m, 4H) EI-ms 231 (M⁺)、172、144	77~79℃
33		δ:0.88 (m, 3H)、1.2~1.4 (m, 26H)、 1.45~1.54 (m, 2H)、1.84~1.92 (m, 2H)、 2.25 (s, 3H)、2.73 (s, 3H)、2.78 (t, 2H, J=7.6Hz)、7.4~8.0 (m, 4) EI-ms 411 (M⁺)、239、173、144	69~71℃

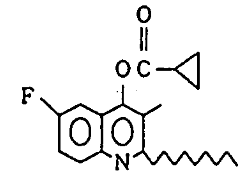
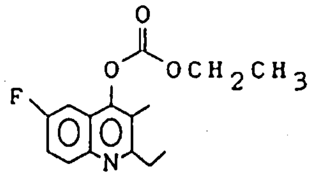
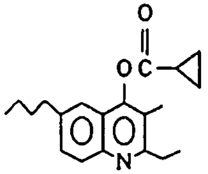
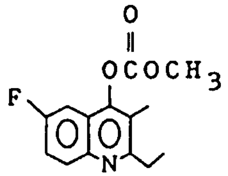
Compound No.	Compound	Spectral data	m. p.
34		δ : 1. 14 (d, 6H, 6. 7Hz)、2. 25 (s, 3H)、 2. 32~2. 39 (m, 1H)、2. 67 (d, 2H, J=6. 9Hz)、2. 72 (s, 3H)、 7. 45~8. 02 (m, 4H) EI-ms 257 (M⁺)、173、144	66~67℃
35		δ : 1. 53 (s, 9H)、2. 24 (s, 3H)、 2. 73 (s, 3H)、7. 45~8. 02 (m, 4H) EI-ms 257 (M⁺)、173、144	141~142℃
36		δ : 1. 13~1. 19 (m, 2H)、 1. 28~1. 32 (m, 2H)、2. 03~2. 10 (m, 1H)、 2. 26 (s, 3H)、2. 72 (s, 3H)、 7. 46~8. 02 (m, 4H) EI-ms 241 (M⁺)、173、144	87~88℃
37		δ : 1. 43 (d, 6H, J=6. 2Hz)、2. 32 (s, 3H)、 2. 74 (s, 3H)、5. 03 (m, 1H)、 7. 48~8. 03 (m, 4H) EI-ms 259 (M⁺)、200、173、144	71~72℃

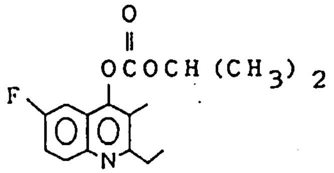
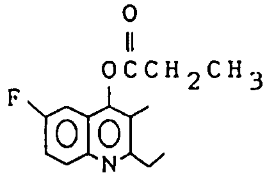
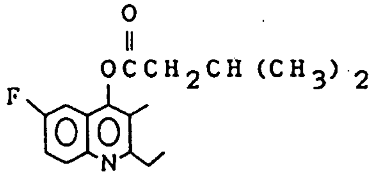
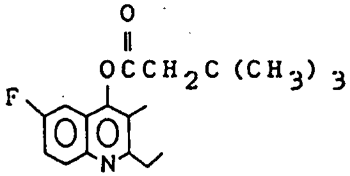
Compound No.	Compound	Spectral data	m. p.
38		δ:0. 99 (t, 3H, J=7. 3Hz)、1. 42~1. 53 (m, 2H)、1. 74~1. 81 (m, 2H)、2. 32 (s, 3H)、2. 73 (s, 3H)、4. 33 (t, 2H; J=6. 7Hz)、7. 49~8. 03 (m, 4H) EI-ms 273 (M⁺)、200、173、144	42~44℃
39		δ:2. 40 (s, 3H)、2. 75 (s, 3H)、7. 24~8. 06 (m, 9H) EI-ms 293 (M⁺)、173、156	87~89℃
40		NMR (CDCl₃) δ:0. 96 (t, 3H, J=6. 6Hz)、1. 3~2. 0 (m, 4H)、2. 26 (s, 3H)、2. 46 (s, 3H)、2. 86~3. 10 (m, 2H)、7. 3~7. 8 (m, 3H)、8. 01 (d, 1H, J=8Hz) EI-ms 257 (M⁺)、215	74~75℃
41		NMR (CDCl₃) δ:0. 75~1. 05 (m, 3H)、1. 25~1. 95 (m, 6H)、2. 28 (s, 3H)、2. 49 (s, 3H)、2. 8~3. 1 (m, 2H)、7. 3~7. 7 (m, 3H)、8. 02 (d, 1H, J=8Hz) EI-ms 271 (M⁺)、215	64~65℃

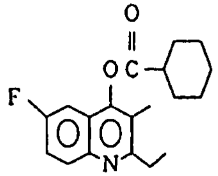
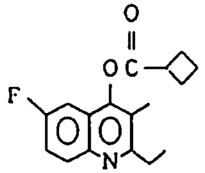
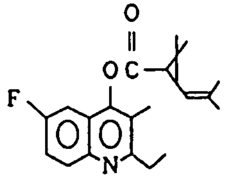
Compound No.	Compound	Spectral data	m. p.
42		NMR ($CDCl_3$) δ: 0. 87 (t, 3H, J=6Hz)、 1. 1~2. 0 (m, 8H)、2. 26 (s, 3H)、2. 46 (s, 3H)、 2. 97 (dd, 2H, J=9Hz, J=7Hz)、 7. 2~7. 7 (m, 3H)、8. 00 (d, 1H, J=8Hz) EI-ms 285 (M^+)、242、215	55~56℃
43		NMR ($CDCl_3$) δ: 0. 87 (t, 3H, J=6Hz)、1. 1~ 1. 9 (m, 8H)、2. 24 (s, 3H)、2. 46 (s, 3H)、 2. 94 (dd, 2H, J=9Hz, J=7Hz)、7. 1~7. 5 (m, 2H)、7. 99 (dd, 1H, J=9. 0Hz, J=5. 3Hz) EI-ms 303 (M^+)	66~67℃
44		NMR ($CDCl_3$) δ: 0. 86 (t, 3H, J=6Hz)、 1. 0~1. 45 (m, 8H)、1. 5~1. 9 (m, 2H)、 2. 43 (s, 3H)、2. 95 (dd, 2H, J=9Hz, J=7Hz)、 7. 16 (s, 1H)、7. 2~8. 1 (m, 4H) EI-ms 285 (M^+)、242、201	oil
45		NMR ($CDCl_3$) δ: 0. 86 (t, 3H, J=6Hz)、1. 1~ 1. 5 (m, 8H)、1. 6~1. 9 (m, 2H)、2. 25 (s, 3H)、 2. 45 (s, 3H)、2. 96 (dd, 2H, J=9Hz, J=7Hz)、 7. 3~7. 8 (m, 3H)、8. 00 (d, 1H, J=8Hz) EI-ms 299 (M^+)、256、215	57~58℃
46		NMR ($CDCl_3$) δ: 2. 18 (s, 3H)、2. 44 (s, 3H)、 2. 64 (s, 3H)、3. 85 (s, 3H)、6. 88 (d, 1H, J=2. 6Hz)、7. 25 (dd, 1H, J=9. 2Hz, J=2. 6Hz)、7. 89 (d, 1H, J=9. 2Hz) EI-ms 245 (M^+)、203	106~107℃

Compound No.	Compound	Spectral data	m. p.
47		NMR (CDCl$_3$) δ: 1.27 (t, 3H, J=7.6Hz)、2.20 (s, 3H)、2.46 (s, 3H)、2.66 (s, 3H)、2.77 (q, 2H, J=7.6Hz)、7.33~7.53 (m, 2H)、7.91 (d, 1H, J=8.4Hz) EI-ms 243 (M^+)、201	87~88℃
48		NMR (CDCl$_3$) δ: 1.31 (t, 3H, J=7.5Hz)、2.17 (s, 3H)、2.41 (s, 3H)、2.65 (s, 3H)、3.23 (q, 2H, J=7.5Hz)、7.23~7.53 (m, 3H)、 EI-ms 243 (M^+)	73~74℃
49		NMR (CDCl$_3$) δ: 0.91 (t, 3H, J=6.2Hz)、1.20~1.84 (m, 4H)、2.20 (s, 3H)、2.46 (s, 3H)、2.66 (s, 3H)、2.7~2.9 (m, 2H)、7.3~7.5 (m, 2H)、7.89 (d, 1H, J=8Hz) EI-ms 271 (M^+)、229	80~81℃
50		NMR (CDCl$_3$) δ: 2.32 (s, 3H)、2.75 (s, 3H)、7.25 (dd, 1H, J=5.1Hz, J=3.7Hz)、7.3~8.2 (m, 6H) EI-ms 283 (M^+)	153~154℃

Compound No.	Compound	Spectral data	m. p.
51		NMR ($CDCl_3$) δ : 2. 31 (s, 3H)、2. 76 (s, 3H)、6. 67 (q, 1H, J=1. 8Hz)、7. 2~7. 8 (m, 5H)、8. 06 (d, 1H, J=8Hz) EI-ms 267 (M^+)、172	115~116℃
52		NMR ($CDCl_3$) δ : 0. 85 (t, 3H, J=6Hz)、1. 1~1. 5 (m, 12H)、1. 6~1. 9 (m, 2H)、2. 42 (s, 3H)、2. 95 (dd, 2H, J=9Hz, J=7Hz)、7. 14 (s, 1H)、7. 3~8. 1 (m, 4H)、 EI-ms 313 (M^+)、270、201	oil
53		NMR ($CDCl_3$) δ : 0. 85 (t, 3H, J=6Hz)、1. 1~1. 5 (m, 12H)、1. 6~1. 9 (m, 2H)、2. 23 (s, 3H)、2. 43 (s, 3H)、2. 97 (dd, 2H, J=9Hz, J=7Hz)、7. 3~7. 7 (m, 3H)、7. 98 (d, 1H, J=8Hz) EI-ms 327 (M^+)、284、215	52~53℃
54		NMR ($CDCl_3$) δ : 0. 88 (t, 3H, J=6Hz)、1. 1~1. 5 (m, 12H)、1. 6~2. 0 (m, 2H)、2. 27 (s, 3H)、2. 49 (s, 3H)、2. 96 (dd, 2H, J=9Hz, J=7Hz)、7. 1~7. 5 (m, 2H)、8. 02 (dd, 1H, J=5Hz, J=9Hz) EI-ms 346 (M^+)	78~79℃

Compound No.	Compound	Spectral data	m. p.
55		NMR (CDCl$_3$) δ: 0.89 (t, 3H, J=5Hz)、 1.0~2.1 (m, 13H)、2.27 (s, 3H)、 2.95 (dd, 2H, J=8Hz, 7Hz)、 7.1~7.5 (m, 2H)、7.96 (dd, 1H, J=9Hz, J=5Hz) EI-ms 330 (M$^+$)、259	50~51℃
56		NMR (CDCl$_3$) δ: 1.38 (t, 3H, J=7.4Hz)、 1.44 (t, 3H, J=7.1Hz)、2.33 (s, 3H)、 3.01 (q, 2H, J=7.4Hz)、 4.39 (q, 2H, J=7.1Hz)、7.1~7.5 (m, 2H)、 8.03 (dd, 1H, J=10.0Hz, 5.2Hz) EI-ms 277 (M$^+$)、205	64~65℃
57		NMR (CDCl$_3$) δ: 0.93 (t, 3H, J=6Hz)、 1.1~2.2 (m, 9H)、2.21 (s, 3H)、 2.67 (s, 3H)、2.7~2.9 (m, 2H)、 7.3~7.5 (m, 2H)、7.89 (d, 1H, J=10Hz) EI-ms 297 (M$^+$)、229	83~84℃
58		NMR (CDCl$_3$) δ: 1.35 (t, 3H, J=7.5Hz)、 2.31 (s, 3H)、2.98 (q, 2H, J=7.5Hz)、 3.95 (s, 3H)、7.1~7.5 (m, 2H)、 7.99 (dd, 1H, J=10Hz, 5Hz) EI-ms 263 (M$^+$)、204	67~68℃

Compound No.	Compound	Spectral data	m. p.
59		NMR (CDCl$_3$) δ: 1.38 (t, 3H, J=7.7Hz), 1.39 (s, 3H), 1.46 (s, 3H), 2.33 (s, 3H), 4.8~5.2 (m, 1H), 7.2~7.5 (m, 2H), 8.03 (dd, 1H, J=10.1Hz, 5.3Hz) EI-ms 292 (M^+), 291 (M^+), 205	52~53℃
60		NMR (CDCl$_3$) δ: 1.40 (t, 3H, J=7.5Hz), 2.27 (s, 3H), 2.6~3.2 (m, 4H), 7.1~7.5 (m, 2H), 7.98 (dd, 1H, J=9Hz, 5Hz) EI-ms 261 (M^+), 205	114~115℃
61		NMR (CDCl$_3$) δ: 1.11 (s, 3H), 1.18 (s, 3H), 1.37 (t, 3H, J=7.5Hz), 2.1~2.5 (m, 1H), 2.27 (s, 3H), 2.66 (d, 2H, J=6.6Hz), 3.01 (q, 2H, J=7.5Hz), 7.1~7.5 (m, 2H), 8.03 (dd, 1H, J=9Hz, 5.5Hz) EI-ms 289 (M^+), 205	73~74℃
62		NMR (CDCl$_3$) δ: 1.22 (s, 9H), 1.37 (t, 3H, J=7.5Hz), 2.28 (s, 3H), 2.69 (s, 2H), 3.01 (q, 2H, J=7.5Hz), 7.1~7.5 (m, 2H), 8.02 (dd, 1H, J=9.0Hz, 5.5Hz) EI-ms 303 (M^+), 205	82~83℃

Compound No.	Compound	Spectral data	m. p.
63		NMR ($CDCl_3$) δ: 1.37 (t, 3H, J=7.5Hz)、 1.4~2.4 (m, 10H)、2.25 (s, 3H)、 2.5~2.9 (m, 1H)、3.00 (q, 2H, J=7.5Hz)、 7.1~7.5 (m, 2H)、8.02 (dd, 1H, J=9.2Hz, 5.1Hz) EI-ms 315 (M^+)、232、205	96~97℃
64		NMR ($CDCl_3$) δ: 1.37 (t, 3H, J=7.5Hz)、 1.7~2.2 (m, 3H)、2.26 (s, 3H)、 2.3~2.7 (m, 3H)、3.00 (q, 2H, J=7.5Hz)、 3.57 (q, 1H, J=8.6Hz)、7.1~7.5 (m, 2H)、 8.02 (dd, 1H, J=9.1Hz, 5.3Hz) EI-ms 287 (M^+)、232、205	85~86℃
65		NMR ($CDCl_3$) δ: 1.29 (s, 3H)、 1.34 (t, 3H, J=7.7Hz)、1.38 (s, 3H)、 1.7~1.9 (m, 7H)、2.1~2.4 (m, 1H)、 2.26 (s, 3H)、2.98 (q, 2H, J=7.7Hz)、 4.9~5.4 (m, 1H)、7.1~7.5 (m, 2H)、 7.8~8.1 (m, 1H) EI-ms 355 (M^+)、205	87~88℃

Preparation Example 1. Emulsion

A 10 parts by weight amount of polyoxyethylenealkyl allyl ether was added to the mixture of 20 parts by weight of the compound of the present invention, 20 parts by weight of N. N-dimethylformamide and 50 parts by weight of xylene, and the mixture was uniformly mixed and dissolved to give an emulsion.

Preparation Example 2. Hydration agent

Twenty five parts by weight of the compound of the present invention, 30 parts by weight of clay, 35 parts by weight of diatomaceous earth, 3 parts by weight of calcium lignin sulfate and 7 parts by weight amount of polyoxyethylenealkyl allyl ether were uniformly mixed and ground to give a hydration agent.

Preparation Example 3. Powder

Two parts by weight of the compound of the present invention, 60 parts by weight of clay, 37 parts by weight of talc and 1 part by weight of calcium stearate were mixed uniformly to give a powder.

Preparation Example 4. Pellet

Five parts by weight of the compound of the present invention, 40 parts by weight of bentonite, 53 parts by weight of talc and 2 parts by weight of calcium lignin sulfate were milled and mixed. The mixture was kneaded sufficiently with the addition of water before granulation and drying to give pellets.

Test Example 1. Test of effectiveness of the preparation on the larva of Tobacco Cutworm

A preparation was prepared in accordance with Preparation Example 1, and 10 third or forth instar larvae of Tabacco Cut worm were dipped into the preparation liquid which had been diluted to 1000 ppm with water containing a surfactant (0.01 %) for 10 seconds. The larvae were released to a plastic cup having a diameter of 9 cm into which piece of cabbage leaf (5 cm x 5 cm), and the cup was left in an thermostat at 25 °C . The survival number and mortality of the worms were counted after two days to obtain the mortality rate. The result is shown in Table 1.

Mortality (%) =(number of dead insects/released insects) × 100

Table 1

Compound No.	Mortality (%)
2	100
4	100
9	100
10	100
14	90
15	100
20	100
21	100
22	100
23	70
26	100
28	100
31	100
34	100
36	90
37	100
38	100
47	90
56	100
57	100
58	100
59	100
60	100
61	100
62	100
63	100
64	100

Test Example 2. Test of effectiveness of the preparation on Myzus persicae

A preparation was prepared in accordance with Preparation Example 1, and a cabbage leaf piece on which 10 apterous viviparae of the aphid had been inoculated was dipped into the preparation liquid which had been diluted to 1000 ppm with water containing a surfactant (0.01 %) for 10 seconds. After air drying, the leaf was placed in a plastic cup having a diameter of 9 cm and left in an thermostat at 25 °C. The survival number and mortality of the worms were counted after one day to obtain the mortality. The result is shown in Table 2.

Mortality (%) =(number of dead insects/released insects) × 100

Table 2

Compound No.	Mortality (%)
1	100
7	100
9	100
10	100
11	100
12	90
14	100
15	100
18	100
21	100
23	100
24	100
25	100
26	100
28	100
30	100
31	100
34	100
36	100
37	100
38	100
40	100
41	100
44	100
45	100
47	100
49	100
52	100
53	100
55	100
57	100

Test Example 3. Test of effectiveness of the preparation on Tetranychus cinnabarinus (organic phosphate resistant)

A preparation was prepared in accordance with Preparation Example 1 and diluted to 1000 ppm with water containing a surfactant (0.01 %). Ten of adult males of the mits were placed on a first leaf of kidney bean which had grown in a plastics pot having a diameter of 9 cm. After 24 hours, ten ml of the solution was sprayed on the leaf, and the pot was left in an thermostat at 25 °C . The survival number and mortality of the worms were counted after two days to obtain the mortality rate. The result is shown in Table 3.

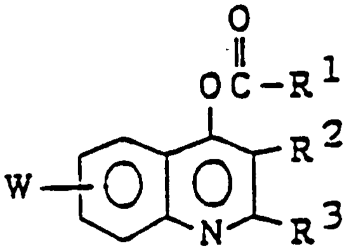
Mortality (%) =(number of dead mits/released mits) × 100

Table 3

Compound No.	Mortality (%)
4	100
7	100
8	100
9	100
11	100
14	100
34	100
37	100
36	100
38	100
45	100
52	100
53	100

Claims

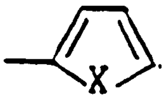
1. A 4-acyloxyquinoline derivative represented by the general formula (I):



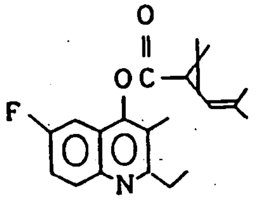
(I)

wherein

R^1 represents hydrogen; C_{1-18} alkyl; C_{2-18} alkenyl; C_{3-10} cycloalkyl which may be optionally substituted with halogen or C_{1-4} alkyl; phenyl-C_{1-4} alkyl; phenyloxy-C_{1-4} alkyl; phenyl; C_{1-4} alkyl and/or halogen-substituted phenyl; naphthyl; C_{1-4} alkyl and/or halogen-substituted naphthyl; a group OR^4 where R^4 represents C_{1-4} alkyl, phenyl, C_{1-4} alkyl and/or halogen-substituted phenyl, naphthyl, or C_{1-4} alkyl and/or halogen-substituted naphthyl; or a group:



where X represents an oxygen or a sulphur atom;
R^2 represents C_{1-4} alkyl; or a group $-COOR^5$ where R^5 represents hydrogen or C_{1-4} alkyl;
R^3 represents hydrogen or C_{1-10} alkyl;
provided that R^2 does not represent $COOR^5$ when R^3 represents hydrogen; and
R^2 and R^3 may together represent $\text{-(}CH_2\text{)-}_m$, where m is 3 or 4;
W represents hydrogen, one to four halogen atoms, C_{1-4} alkyl or C_{1-4} alkoxy which may be same or different and with which the left-hand benzene ring is substituted; or a derivative represented by the formula:



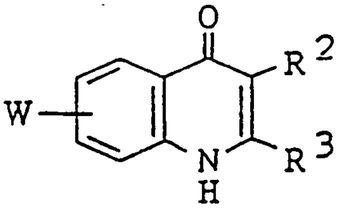
2. 4-Acetoxy-2,3-dimethyl-6-fluoroquinoline.

3. 4-Acetoxy-2-ethyl-6-fluoro-3-methylquinoline.

4. 4-Cyclopropanecarbonyloxy-2-ethyl-6-fluoro-3-methylquinoline.

5. 4-Ethoxycarbonyloxy-2-ethyl-6-fluoro-3-methylquinoline.

6. A process for the preparation of compounds of general formula (I) as defined in claim 1, which comprises: reacting a compound of formula (II):

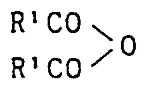


(II)

wherein R^2 and R^3 are as defined in formula (I), with a compound of formula(III):

$$R^1COC\ell \qquad \text{(III)}$$

wherein R^1 is as defined in formula (I), or a compound (IV):

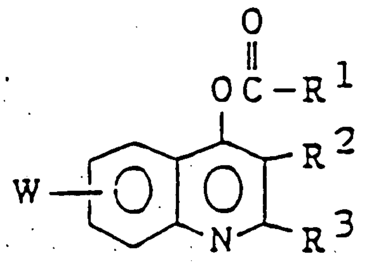

$$\begin{matrix}R^1CO\\R^1CO\end{matrix}\!\!>O$$

(IV)

wherein R^1 is as defined in formula (I).

Patentansprüche

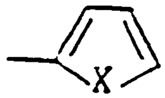
1. Ein 4-Azyloxychinolin-Derivat, wie es in der allgemeinen Formel (I):



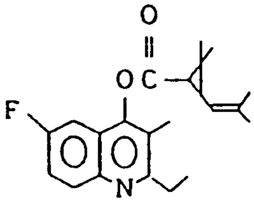
(I)

dargestellt ist, worin

R_1 für Wasserstoff; C_{1-18} Alkyl; C_{2-18} Alkenlyl; C_{3-10} Zykloalkyl, welches optional mit Halogen oder C_{1-4} Alkyl substituiert ist; Phenyl-C_{1-4} Alkyl; Phenyloxy-C_{1-4} Alkyl; Phenyl; C_{1-4} Alkyl und/oder Halogen-substituiertes Phenyl; Naphtyl; C_{1-4} Alkyl und/oder Halogen-substituiertes Naphtyl; eine Gruppe OR^4 worin R^4 für C_{1-4} Alkyl, Phenyl, C_{1-4} Alkyl und/oder Halogen- substituiertes Phenyl, Naphtyl, oder C_{1-4} Alkyl und /oder Halogen-substituiertes Naphtyl; oder eine Gruppe



steht, in der X für ein Sauerstoff- oder ein Schwefelatom steht;
R^2 steht für C_{1-4} Alkyl; oder eine Gruppe $-COOR^5$ worin R^5 für Wasserstoff oder C_{1-4} Alkyl steht;
R^3 steht für ein Wasserstoff oder ein C_{1-10} Alkyl;
vorausgesetzt, dass R^2 nicht für $COOR^5$ steht, wenn R^3 für Wasserstoff steht; und
R^2 und R^3 miteinander für $(CH_2)_m$ stehen können, wobei m 3 oder 4 ist;
W steht für Wasserstoff, ein bis vier Halogenatome, C_{1-4} Alkyl oder C_{1-4} Alkoxy, welche gleich oder unterschiedlich sein können und mit welchen der Benzolring linker Hand substituiert ist; oder ein Derivat, wie es in der Formel:



dargestellt ist.

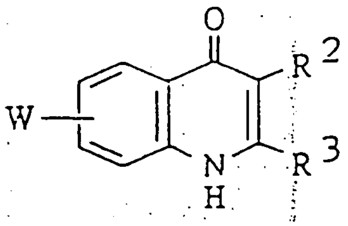
2. 4-Azetoxy-2,3-dimethyl-6-fluorchinolin.

3. 4-Azetoxy-2-ethyl-6-fluor-3-methylchinolin.

4. 4-Zyklopropancarbonyloxy-2-ethyl-6-fluor-3-methylchinolin.

5. 4-Ethoxycarbonyloxy-2-ethyl-6-fluor-3-methylchinolin.

6. Ein Verfahren zur Herstellung von Verbindungen gemäss der allgemeinen Formel (I), wie es in Anspruch 1 definiert ist, welches folgendes beinhaltet:
eine Verbindung gemäss der Formel (II):

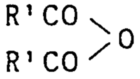


(II)

in der R^2 und R^3 wie in Formel (I) definiert sind, wird mit einer Verbindung gemäss Formel (III):

$$R^1COCl \qquad (III)$$

in der R^1 so definiert ist wie in Formel (I), oder mit einer Verbindung (IV):

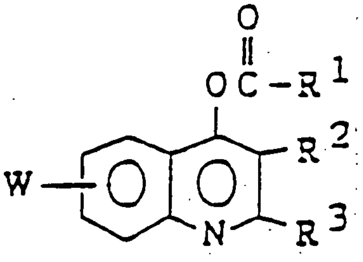


$$\begin{matrix} R^1CO \\ R^1CO \end{matrix} > O \qquad (IV)$$

in der R^1 so definiert ist wie in Formel (I), zur Reaktion gebracht.

Revendications

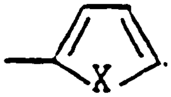
1. Dérivé de 4-acyloxyquinoléine représenté par la formule générale (I) :



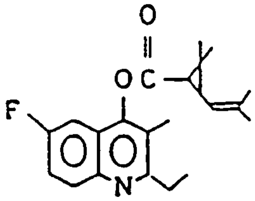
(I)

dans laquelle :

R^1 représente un hydrogène ; un groupe alkyle en C_{1-18} ; alcényle en C_{2-18} ; cycloalkyle en C_{3-10}, qui peut être éventuellement substitué par des halogènes ou des groupes alkyle en C_{1-4} ; phényl(alkyle en C_{1-4}) ; phényloxy(alkyle en C_{1-4}) ; phényle ; phényle à substitution alkyle en C_{1-4} et/ou halogéné ; naphtyle ; naphtyle à substitution alkyle en C_{1-4} et/ou halogéné ; un groupe OR^4 où R^4 est un groupe alkyle en C_{1-4}, phényle, phényle à substitution alkyle en C_{1-4} et/ou halogéné, naphtyle ou naphtyle à substitution alkyle en C_{1-4} et/ou halogéné ; ou un groupe



dans lequel X représente un atome d'oxygène ou de soufre ;
R^2 représente un groupe alkyle en C_{1-4} ; ou encore un groupe -COOR^5 dans lequel R^5 est un hydrogène ou un groupe alkyle en C_{1-4} ;
R^3 est un hydrogène ou un groupe alkyle en C_{1-10} ;
du moment que R^2 ne représente pas $COOR^5$ quand R^3 représente un hydrogène ; et
R^2 et R^3 peuvent ensemble représenter $-(CH_2)_m-$ où m vaut 3 ou 4 ;
W représente un hydrogène, un à quatre atomes d'halogène, groupes alkyle en C_{1-4} ou alcoxy en C_{1-4} qui peuvent être identiques ou différents, et par lesquels est substitué le noyau benzénique de gauche ;
ou un dérivé représenté par la formule



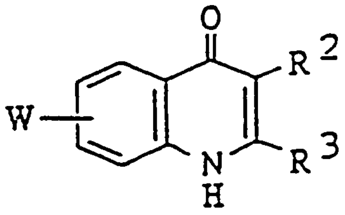
2. 4-Acétoxy-2,3-diméthyl-6-fluoroquinoléine.

3. 4-Acétoxy-2-éthyl-6-fluoro-3-méthylquinoléine.

4. 4-Cyclopropanecarbonyloxy-2-éthyl-6-fluoro-3-méthylquinoléine.

5. 4-Ethoxycarbonyloxy-2-éthyl-6-fluoro-3-méthylquinoléine.

6. Procédé de production de composés de formule générale (I) selon la revendication 1, qui comprend l'étape consistant à faire réagir un composé de formule (II) :

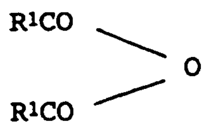


(II)

dans laquelle R^2 et R^3 sont tels que définis dans la formule (I), avec un composé de formule (III) :

$$R^1COCl \qquad (III)$$

dans laquelle R^1 est tel que défini dans la formule (I), ou encore un composé de formule (IV) :



$$(R^1CO)_2O$$

(IV)

dans laquelle R^1 est tel que défini dans la formule (I).